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| APPLICATION NO.                      | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--------------------------------------|-------------|----------------------|---------------------|------------------|
| 10/679,508                           | 10/07/2003  | Takehiro Yoshida     | 061063-0306275      | 8407             |
| 909                                  | 7590        | 02/08/2006           | EXAMINER            |                  |
| PILLSBURY WINTHROP SHAW PITTMAN, LLP |             |                      | DETSCHER, MARISSA   |                  |
| P.O. BOX 10500                       |             |                      | ART UNIT            |                  |
| MCLEAN, VA 22102                     |             |                      | PAPER NUMBER        |                  |
|                                      |             |                      | 2877                |                  |

DATE MAILED: 02/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/679,508

Applicant(s)

YOSHIDA, TAKEHIRO

Examiner

Marissa J. Detschel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-12 and 16-21 is/are rejected.
- 7) ☒ Claim(s) 4-6 and 13-15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 2002-296329, filed on October 9, 2002 in Japan.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a) because they fail to show a dichroic mirror **7** in figure 1 as described in the specification on page 8, line 5. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d).

Figures 10 and 11 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

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application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claim 5, 12, and 14 are objected to because of the following informalities:

As to claim 5, the phrase "plane grating satisfies a relationship" in line 2 of this claim should read as "plane grating that satisfies a relationship." Furthermore, the phrase "under condition that  $\alpha$  indicates an incident angle" in line 5 of this claim should read "under the condition that  $\alpha$  indicates an incident angle."

As to claim 12, the claim as presented is dependent upon claim 12 (i.e. itself). Examiner suggests changing this claim to be dependent upon claim 11.

As to claim 14, the phrase "plane grating satisfies a relationship" in line 2 of this claim should read as "plane grating that satisfies a relationship." Furthermore, the phrase "under condition that  $\alpha$  indicates an incident angle" in line 5 of this claim should read "under the condition that  $\alpha$  indicates an incident angle."

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

Claims 1, 2, 3, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kojima (USPN 6,081,332) in view of Amos (USPN 6,555,811).

Regarding claim 1, Kojima discloses a device comprising:

an entrance aperture member (1) for passing a light (column 3, lines 54-57);

a first optical system (3) which collimates a dispersing light which is emitted from the entrance aperture member into an approximate collimated light flux (column 3, lines 57-59);

a dispersing element (5) which is disposed so as to freely rotate (via 10) for dispersing the approximate collimated light flux (column 3, lines 59-62 and column 4, lines 1-4);

a second optical system (7) for condensing the light flux which is dispersed by the dispersing element near a focal plane (column 3, lines 62-64);

a slit (9) which is disposed near the focal plane (column 3, lines 64-67); and

an optical detector for detecting a light flux which passes the slit among the dispersed light flux according to the slit width or the rotation of the dispersing element.

Kojima does not distinctly disclose the use of an optical detector for detecting a light flux which passes through the slit among the dispersed light flux according to the rotation of the dispersing element. Kojima's device does aid in detecting spectrum of light due to the angle of the diffraction grating as it is being rotated (column 4, lines 64 to column 5, line 2). It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize an optical detector in the device of Kojima in order to detect the spectrum of the light flux.

Kojima does not disclose that the slit is a variable-width slit. Amos discloses a variable-width slit (34) in a device that utilizes a dispersive optical means to produce a series of separated images of differing wavelengths (i.e. spectra) of a sample from a scanning confocal microscope system (column 2, lines 43-50). The apertures (i.e. slits)

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are adjustable by way of varying the width or diameter of the apertures (column 3, lines 11-16). This controls the passage of the light to a detector (column 4, lines 39-41). It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the variable-width slit of Amos in Kojima's device in order to control the passage of the light to a detector, allowing only the desired light wavelengths to reach the detector, enabling more accurate spectral measurements.

In regards to claim 2, Kojima discloses that aberrations for a plurality of wavelengths of an off-axial light flux are compensated in the second optical system (7). Kojima's device does this by utilizing an achromatic lens (column 4, lines 42-44).

Regarding claim 3, Kojima discloses that the aberrations be compensated using an achromatic lens (column 4, lines 42-44). Achromatic lenses can have structures utilizing a plurality of lenses.

In regards to claim 7, Kojima discloses that the dispersing element is a reflective plane grating (column 3, lines 59-62);

the optical detector detects a light flux having a desirable wavelength by rotating the reflective plane grating (column 4, line 64 to column 5, line 2).

Kojima does not disclose that the device utilizes a variable-width slit. Motivation for combining a variable-width slit as disclosed by Amos with the device of Kojima has been presented above. With the use of this slit, the passage of the light onto a detector for measurement is controlled, allowing the optical detector to detect a light flux having a desirable wavelength selectively by changing the width of the slit.

Regarding claim 8, Kojima in view of Amos as presented allows an optical detector to detect a light flux having a desirable wavelength selectively by changing the slit width of the variable-width slit under the condition that a prism is used for a fixed dispersing element. Kojima discloses that the dispersing element can be a prism (column 6, lines 19-22).

Claims 9-12 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amos (USPN 6,555,811) in view of Kojima (USPN 6,081,332).

In regards to claims 9 and 19, Amos discloses a scanning confocal optical microscope comprising:

A light source (11);

An objective lens (16) which condenses a light which is emitted from the light source (11) on a sample (17) (column 1, line 61 to column 2, line 1);

A light condensing optical system (16 and 19) which condenses a light which is reflected by the sample (17) or a light which is emitted from the sample (column 1, line 61 to column 2, line 1);

An aperture member (20) which is disposed at a focal point in the light condensing optical system (16 and 19) so as to be optically conjugate with the sample (column 2, lines 3-6);

A first optical system (25 and 26);

A dispersing element (28) for dispersing the light flux;

A second optical system (30) which condenses the light flux which is dispersed by the dispersing element (28) near the focal plane;

A variable-width slit (34) which is disposed near the focal plane of which slit width is variable (column 3, lines 11-16); and

An optical detector (35) which detects light fluxes according to the width of the slit or the dispersing element (28) (column 4, lines 38-41).

Amos' dispersing element is not disclosed as rotating, but rather a beam-separating means is adjustable to enable variation of the wavelengths being measured (column 3, lines 39-41). Kojima discloses a device for measuring spectra at selected wavelengths utilizing a rotating (via 10) grating (5) that allows for different spectra to be detected at different rotational positions of the grating (column 4, line 64 to column 5, line 2). It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the rotatable grating in the device of Kojima as the dispersing element with beam-separating means of Amos in order to selectively vary the wavelengths to be measured.

Furthermore, Amos' device does not disclose that the first optical system collimates the dispersed light which is emitted from the aperture member into an approximate parallel light. It would have been obvious to one of ordinary skill in the art at the time of the invention to use an optical system to collimate the dispersed light emitted from an aperture member in order to create parallel light beams to enable that all the light to be analyzed be disposed upon the dispersing element, resulting in a more accurate measurement.

Regarding specifically claim 19, the laser scanning microscope of Amos is a scanning confocal microscope (column 1, lines 6-7).

In regards to claim 10, Amos does not distinctly disclose that the aperture member (20) has an aperture which is formed as a pinhole. The first aperture used in the device of Amos discloses a pinhole structure (column 1, lines 58-60), and, as a result, presents that the structure of such an aperture can be used in this device. Therefore, the other aperture member (20) can also be of a pinhole structure.

In regards to claims 11 and 12, Amos does not disclose that the aberrations for a plurality of wavelengths of an off-axial light flux are compensated in the second optical system (30). Kojima's device does this by utilizing an achromatic lens (column 4, lines 42-44) Achromatic lenses can be made from a plurality of lenses. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the achromatic lenses of Kojima's device as the lenses of Amos' device to compensate for aberrations in the device in order to create a more accurate measurement.

Regarding claim 16, the motivation behind the use of the rotating reflective plane grating of Kojima in place of the dispersing element with beam separating means of Amos has been presented above. Therefore, with the use of this rotating grating, the optical detector of Amos would detect a light flux having a desirable wavelength selectively by rotating the reflective plane grating and changing the width of the slit of the variable-width slit (column 3, lines 39-41 and column 4, lines 38-41).

In regards to claim 17, the optical detector of Amos detects a light flux having a desirable wavelength selectively by changing the slit width of the variable-width slit (column 3, lines 39-41) under the condition that a prism is used for a fixed dispersing element (column 4, lines 8-11).

In regards to claim 18, Amos in view of Kojima fails to disclose the use of a single mode fiber disposed at the incident end of the measurement device instead of the aperture member disclosed. The Examiner takes Official Notice of the fact that fibers are known to be used at incident ends of laser scanning microscopes to introduce light into the system. It would have been obvious to one of ordinary skill in the art to utilize a single mode fiber in the laser scanning microscope of Amos in view of Kojima because they are readily available and allow for more flexibility of where to input the light into the system.

Regarding claim 20, a relationship such as  $\Delta\lambda < 20 \text{ nm}$  is effective under condition that  $\Delta\lambda$  indicates a wavelength resolution for separating a light having a wavelength  $\lambda$  from a light having a wavelength  $(\lambda + \Delta\lambda)$  (column 5, lines 7-11).

In regards to claim 21, a relationship such as  $\Delta\lambda < 5 \text{ nm}$  is effective under condition that  $\Delta\lambda$  indicates a wavelength resolution for separating a light having a wavelength  $\lambda$  from a light having a wavelength  $(\lambda + \Delta\lambda)$  (column 5, lines 7-11).

***Allowable Subject Matter***

Claims 4-6 and 13-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As to claims 4 and 13, the prior art of record, taken alone or in combination, fails to disclose or render obvious the use of a second optical system comprising a lens

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having a positive focal length (Abbe number  $v_+$ ) and a lens having a negative focal length (Abbe number  $v_-$ ) with a relationship such as  $v_+ - v_- > 25$ , in combination with the rest of the limitations of claims 4 and 13.

As to claims 5 and 14, the prior art of record, taken alone or in combination, fails to disclose or render obvious the use of a reflective plane grating that satisfies a relationship such as

$$0 < \frac{2.44 \cos \alpha}{NmD} < 0.04$$

where  $\alpha$  is the angle of incidence on the grating,  $N$  is the grooves per unit length of the grating,  $m$  is a diffraction order, and  $D$  is the diameter of the light flux that is incident on the grating, in combination with the rest of the limitations of claim 5 and 14.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marissa J. Detschel whose telephone number is 571-272-2716. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on 571-272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Marissa Detschel  
January 30, 2006  
MJD



**HWA (ANDREW) LEE**  
**PRIMARY EXAMINER**